

## ABSTRACT OF THE DISCLOSURE

### MULTI-WAY RADIATION MONITORING

5        A multi-way radiation monitoring and detection system is capable of detecting a radiation source on or within traffic that can travel within M adjacent traffic ways, where M is an integer equal to or greater than a value of 2. The radiation detection system comprises a set of  $(M+1)$  radiation detector assemblies with individual radiation detector assemblies of the set of  $(M+1)$  radiation detector assemblies respectively positioned at each of two sides of each of the M adjacent traffic ways. A set of M controllers is included and each controller is associated with a respective traffic way of the M adjacent traffic ways. Each controller is coupled to the respective individual radiation detector assemblies positioned at the two sides of the traffic way to which that controller is associated, such that two controllers associated with two adjacent traffic ways couple to the individual radiation detector assembly positioned between those two adjacent traffic ways. Each controller is operable to receive a radiation signal produced from at least one radiation detector assembly coupled to that controller to identify a radiation source present in a traffic way adjacent to the at least one radiation detector assembly. Some of the detectors within detector assemblies between traffic ways may be unshielded plastic Gamma radiation detectors, with such detector assemblies or associated controllers having natural background radiation rejection processors.

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